

What Is Claimed Is:

1. A surface mounting device comprising:

5 a plurality of transfers being moved in the X and Y
axis directions by an X-Y gantry installed on a base
frame and supplying a printed circuit board for mounting
parts or loading a discharged printed circuit by a head
unit for sucking parts supplied from a parts supply unit
and mounting the sucked parts on a printed circuit
10 board; and

a plurality of conveyers and being installed to be
moved horizontally in a predetermined direction at a
predetermined position on the base frame and carrying
the printed circuit board supplied from the plurality of
15 transfers to a parts mounting work position and
discharging the same to the plurality of transfers when
the mounting of the parts is finished.

2. The surface mounting device of claim 1, wherein
20 the plurality of transfers comprises a first transfer
installed at one end of the base frame at which the
plurality of conveyer are installed to be moved
horizontally in a predetermined direction and supplies
the printed circuit board to the plurality of conveyer
25 units; and

a second transfer installed at the other end of the
base frame at which the plurality of conveyer units are

09987421 111401
1004444 111401

installed to be moved horizontally in a predetermined direction and loads the printed circuit board discharged from the plurality of conveyer units to the outside of the surface mounting device.

5

3. The surface mounting device of claim 2, wherein the first and second transfers comprise transfer guide frames for guiding the printed circuit board;

10 a plurality of transfer rollers installed at a predetermined interval from each other at side walls of the transfer guide frames and rotated by receiving the rotation force generated from the rotating motor for carrying the printed circuit board; and

15 belt members installed between the plurality of transfer rollers and driven by the rotation of the plurality of transfer rollers, for thereby carrying or loading the printed circuit board.

20 4. The surface mounting device of claim 1 or 2, wherein the plurality of conveyers comprise a first conveyer unit installed to be moved horizontally in a predetermined direction at a predetermined position of the base frame, for thereby carrying the printed circuit board supplied from the first transfer; and

25 a second conveyer unit installed to be moved horizontally in a predetermined direction at a predetermined position of the base frame, for thereby

0593743 "11431
0044T" 12448550

discharging the printed circuit board carried from the first conveyer unit to the second transfer.

5 5. The surface mounting device of claim 4, wherein the first conveyer unit comprises a first conveyer for carrying the printed circuit board supplied from the first transfer; and

10 a first horizontal driving unit installed on the bottom of the first conveyer and at a predetermined position of the base frame for thereby moving horizontally the first conveyer in a predetermined direction.

15 6. The surface mounting device of claim 4, wherein the second conveyer unit comprises a second conveyer for discharging the printed circuit board carried from the first conveyer; and

20 a second horizontal driving unit installed on the bottom of the first conveyer and at a predetermined position of the base frame for thereby moving horizontally the second conveyer in a predetermined direction.

25 7. The surface mounting device of claim 5 or 6, wherein the first and second conveyers each comprises conveyer guide frames for guiding each printed circuit board;

conveyer width adjusting rollers installed at a predetermined position of the conveyer guide frames and for guiding the conveyer guide frames when adjusting the width of the conveyer guide frames according to the width of the printed circuit board;

conveyer lifting members installed on the inside of the conveyer guide frames for mounting the parts to the printed circuit board or discharging the parts; and

first conveyer driving units installed at an inner sidewall of the first conveyer guide frames for carrying the printed circuit board.

8. The surface mounting device of claim 5 or 6, wherein the first and second horizontal driving units are any one among a ball screw driving device, a timing belt driving device, and a linear motor.

9. The surface mounting device of claim 8, wherein the linear motor is any one between a coil mover linear motor and a permanent magnet mover linear motor.

10. A surface mounting device comprising:

a plurality of plane motion transfer units being moved in the X and Y axis directions by an X-Y gantry installed on a base frame and loading a printed circuit board moved in plane motion in a predetermine direction in order to supply or discharge the printed circuit

a first plane driving device for moving the first plane motion transfer in plane motion in a predetermined direction.

- 5 13. The surface mounting device of claim 11, wherein the second plane motion transfer unit comprises a second plane motion transfer for carrying the printed circuit board; and

10 a second plane driving device for moving the first plane motion transfer in plane motion in a predetermined direction.

- 15 14. The surface mounting device of claim 12 or 13, wherein the first and second transfers comprise transfer guide frames for guiding the printed circuit board;

20 a plurality of transfer rollers installed at a predetermined interval from each other at side walls of the transfer guide frames and rotated by receiving the rotation force generated from the rotating motor for carrying the printed circuit board; and

25 belt members installed between the plurality of transfer rollers and driven by the rotation of the plurality of transfer rollers, for thereby carrying or loading the printed circuit board.

15. The surface mounting device of claim 12 or 13, wherein the first and second plane driving devices are a

plane motor, respectively.

16. The surface mounting device of claim 10, wherein the plurality of conveyers comprise a first
5 conveyer unit installed to be moved horizontally in a predetermined direction at a predetermined position of the base frame, for thereby carrying the printed circuit board supplied from the first transfer; and

a second conveyer unit installed to be moved
10 horizontally in a predetermined direction at a predetermined position of the base frame, for thereby discharging the printed circuit board carried from the first conveyer unit to the second transfer.

15 17. The surface mounting device of claim 16, wherein the first conveyer unit comprises a first conveyer for carrying the printed circuit board supplied from the first transfer; and

a first horizontal driving unit installed on the
20 bottom of the first conveyer and at a predetermined position of the base frame for thereby moving horizontally the first conveyer in a predetermined direction.

25 18. The surface mounting device of claim 16, wherein the second conveyer unit comprises a second conveyer for discharging the printed circuit board carried from the

09987421 111401
"04FF" 1248560

first conveyer; and

a second horizontal driving unit installed on the bottom of the first conveyer and at a predetermined position of the base frame for thereby moving
5 horizontally the second conveyer in a predetermined direction.

19. The surface mounting device of claim 17 or 18, wherein the first and second conveyers each comprises
10 conveyer guide frames for guiding each printed circuit board;

conveyer width adjusting rollers installed at a predetermined position of the conveyer guide frames and for guiding the conveyer guide frames when adjusting the
15 width of the conveyer guide frames according to the width of the printed circuit board;

conveyer lifting members installed on the inside of the conveyer guide frames for mounting the parts to the printed circuit board or discharging the parts; and

20 first conveyer driving units installed at an inner sidewall of the first conveyer guide frames for carrying the printed circuit board.

20. The surface mounting device of claim 17 or 18,
25 wherein the first and second horizontal driving units are any one among a ball screw driving device, a timing belt driving device, and a linear motor.

0907421 11403

21. The surface mounting device of claim 20, wherein the linear motor is any one between a coil mover linear motor and a permanent magnet mover linear motor.

5 22. A surface mounting method comprising the steps of:

carrying a printed circuit board loaded on the first transfer to a first conveyer unit by control of a controller;

10 carrying the carried printed circuit board to a second conveyer unit by control of the controller when the printed circuit board is carried to the first conveyer unit;

15 mounting parts on the printed circuit board carried to the second conveyer unit by control of the controller and carrying the printed circuit board loaded on the first transfer to the first conveyer unit when the printed circuit board is carried to the second conveyer unit; and

20 discharging the printed circuit board on which parts have been mounted to the second transfer by control of the controller and carrying the printed circuit board carried to the first conveyer unit when the mounting of parts on the printed circuit board in the second
25 conveyer unit is finished.

23. The surface mounting method of claim 22, wherein

09987423.111401

in the above step of carrying the printed circuit board to the second conveyer unit by the first conveyer unit, it is also possible to mount parts on the printed circuit board carried to the first conveyer unit by control of the controller and then carry the printed circuit board to the second conveyer unit.

24. The surface mounting method of claim 22, wherein in the step of mounting parts on the printed circuit board carried to the second conveyer unit by control of the controller and carrying the printed circuit board loaded on the first transfer to the first conveyer unit when the printed circuit board is carried to the second conveyer unit, the printed circuit board on which parts are mounted is discharged to the second transfer by control of the controller and the printed circuit board loaded on the first transfer can be carried to the first conveyer when parts have been mounted on the printed circuit board carried to the second conveyer unit.

25. A surface mounting method comprising the steps of:

carrying the printed circuit board moved in plane motion by control of a controller in a predetermined direction and loaded on the first plane motion transfer unit to the first conveyer unit or the second plane

motion transfer unit by control of the controller in turns at a predetermined time interval;

mounting parts on the carried printed circuit board by control of the controller when the printed circuit board is carried to the first conveyer unit or the second conveyer unit at a predetermined time interval; and

discharging the printed circuit board on which parts have been mounted to the second plane motion transfer unit moved in plane motion in a predetermined direction by control of the controller is performed when the first conveyer unit or the second conveyer unit has finished the mounting of parts on the printed circuit board.

26. The surface mounting method of claim 25, wherein in the step of carrying the printed circuit board loaded on the first plane motion transfer unit to the first conveyer unit or the second plane motion transfer unit by control of the controller in turns at a predetermined time interval, the first plane motion transfer unit is moved to one end of the first conveyer unit by control of the controller to supply the printed circuit board to the first conveyer unit, and thereafter is moved to one end of the second conveyer unit to supply the printed circuit board to the second conveyer unit.

27. The surface mounting method of claim 25, wherein when the first plane motion transfer unit is moved to one end of the first conveyer unit by control of the controller to supply the printed circuit board to the first conveyer unit, and after a predetermined time, is moved to one end of the second conveyer unit to supply the printed circuit board to the second conveyer unit, the first plane motion transfer unit is moved to one end of the second conveyer unit by control of the controller to supply the printed circuit board to the second conveyer unit, and thereafter is moved to one end of the first conveyer unit to supply the printed circuit board to the first conveyer unit.

28. The surface mounting method of claim 25, wherein in the step of discharging the printed circuit board on which parts have been mounted to the second plane motion transfer unit moved in plane motion in a predetermined direction by control of the controller, when the mounting of parts on the printed circuit board is finished, the second plane motion transfer unit is moved to the other end of the first conveyer unit by control of the controller for thereby discharging the printed circuit board on which parts have been mounted and when the discharging is finished, the second plane motion transfer unit is moved to the other end of the second conveyer unit for thereby receiving the printed

circuit board on which parts have been mounted from the second conveyer unit and loading the same.

29. The surface mounting method of claim 25,
5 wherein when the mounting of parts on the printed circuit board is finished, the second plane motion transfer unit is moved to the other end of the first conveyer unit by control of the controller for thereby discharging the printed circuit board on which parts
10 have been mounted and when the discharging is finished, the second plane motion transfer unit is moved to the other end of the second conveyer unit for thereby receiving the printed circuit board on which parts have been mounted from the second conveyer unit and loading
15 the same, the second plane motion transfer unit is moved to the other end of the second conveyer unit by control of the controller for thereby discharging the printed circuit board on which parts have been mounted and when the discharging is finished, the second plane motion
20 transfer unit is moved to the other end of the first conveyer unit for thereby receiving the printed circuit board on which parts have been mounted from the first conveyer unit and loading the same.

09937421-111401